

AUTHORS: Komar, A.P. and Shrednik, V. N. 126-5-3-11/31  
TITLE:  $\alpha \rightarrow \beta$  Transformation of Zirconium as Observed by Means of  
an Electronic Projector (Prevrashcheniya  $\alpha \rightarrow \beta$  tsirkoniya  
po rablyudeniya s pomoshch'yu elektronnoy proyektora)  
PERIODICAL: Fizika Metallov i Metallovedeniye, 1957, Vol V, Nr 3,  
pp 452-464 + 1 plate (USSR)

ABSTRACT: The aim of the work described in this paper, which was  
started before the publication of the paper by E.G. Brock  
(Phys. Rev., 1955, Vol 100, p 1619), was to evaluate the  
potentialities of the electron projector method for  
studying phase transformations; to verify by means of  
this method the crystallographic relations between the  
lattices of  $\alpha$  and  $\beta$  zirconium obtained by Burgers by  
means of the X-ray method on macroscopic specimens; to  
elucidate the role of the size and shape of the crystal  
on the type of mutual orientation of the lattices of the  
 $\alpha$  and  $\beta$  phases. The authors took into consideration  
the fact that study of zirconium by means of an electron  
projector is of great interest also from the experimenta-  
tion point of view, Muller (Ref.6). So far no regular  
pictures of auto-electron emission of zirconium has been  
obtained proving symmetry of the crystal. Even in the

Card 1/6

126-5-3-11/31

$\alpha \rightarrow \beta$  Transformation of Zirconium as Observed by Means of an Electronic Projector

best vacuum only irregular spots of auto-electron emission are obtained which are due apparently to various contaminations of the crystal surface. In their experiments, the authors used an ordinary electron projector as described by Muller (Ref.6). The anode consisted of a layer of "conducting glass" (Ref.8) on the inside of a spherical glass flask, the surface of which was coated by villemite. The work was carried out with projectors which were continuously evacuated as well as sealed projectors containing tantalum getters. The  $\alpha \rightarrow \beta$  phase transformation is investigated for zirconium single crystals of sizes of the order of one micron. By using the electron projector method it is possible to observe visually the transforming crystal at a magnification of 100 000 times. Emission pictures were obtained of crystals of the cubic ( $\beta$  zirconium) as well as the hexagonal ( $\alpha$  zirconium) symmetry. The results confirmed the relations published by Burgers, W.G., (Physica, 1934, Vol 7, p 561). Usually during transformation only one of the possible orientations of the new phase relative to the

Card 2/6

126-5-3-11/31  
 $\alpha \rightarrow \beta$  Transformation of Zirconium as Observed by Means of an  
 Electronic Projector

initial phase manifests itself, which is attributed to the considerable role of the surface energy in the case of crystals of small dimensions. Signs of dislocation have been detected in zirconium crystals, which are attributed to a diffusionless mechanism of transformation. The method of identification and of indication of the emission pictures of the faces of the zirconium crystal is explained in para.3. Since in the first approximation the shape of the end of the projector point can be assumed as being semi-spherical and since the dimensions of the radius of the point are considerably smaller than the radius of the sphere of the projector, the electric field between the point and the sphere of the projector can, in the given approximation, be considered as the field of a spherical condenser in which the electrons will move along radii of the projector sphere. On hitting the villemite screen, the electrons will produce light on the screen and will produce on the sphere of the projector an orthogonal projection of the faces and edges of the crystal. On this projection it is easy to designate the Card 3/6 centres of the faces which can be considered as being

126-5-3-11/31

$\alpha \rightleftharpoons \beta$  Transformation of Zirconium as Observed by Means of an  
Electronic Projector

spherical projections of the normals to the edges. Obviously, this spherical projection of the normals can easily be inter-related with the gnomo-stereographic projection of the crystal which also enables deciphering the auto-emission picture, which is described. The results of the experiments are described in para.4, which deals with the structure of the face surface and auto-emission as well as with the picture of auto-emission and of  $\alpha \rightleftharpoons \beta$  transformation of zirconium. The results are evaluated in para.5. The following conclusions are arrived at:

1. By means of the electron projector it is possible to determine from the nature of the faces of a crystal point, the mutual orientation of the lattices of the individual phases during polymorphous transformations. For the case of zirconium, the mutual orientation of the lattices of the  $\alpha$  and the  $\beta$  phases, earlier determined by Burgers by means of the X-ray method, was confirmed.
2. The polymorphous transformation of zirconium in the case of crystals with linear dimensions of the order of a

Card 4/6

126-5-3-11/31

$\alpha \rightleftharpoons \beta$  Transformation of Zirconium as Observed by Means of an Electronic Projector

micron takes place according to the non-diffusional method throughout the entire volume of the crystals.

3. The non-equilibrium pseudo-morphous crystal of the accompanying phase becomes transformed into the equilibrium state in the case of high surface mobility of the atoms so that the faces with low indices of the basic and the accompanying crystals remain strictly or approximately parallel.

4. In the case of the studied zirconium crystals, with linear dimensions of about  $1\mu$ , those possible orientations become materialised during transformations which involve a minimum change of the surface energy.

5. The temperature of the polymorphous transformation of the zirconium depends strongly on the quantity of the nitrogen and oxygen absorbed by the zirconium, increasing with increasing concentration.

6. The observed faces of the zirconium crystals with cubic symmetry are not equilibrium faces of pure zirconium but equilibrium faces of crystals of the solid solution of nitrogen and zirconium in presence of a strong electric

Card 5/6

126-5-3-11/31  
 $\alpha \rightarrow \beta$  Transformation of Zirconium as Observed by Means of an  
Electronic Projector

field and a high temperature.

7. The layer by layer spiral destruction of crystals of hexagonal symmetry in a reverse electric field begins from the centres of the faces (11 $\bar{2}$ 0), (1012), (10 $\bar{1}$ 2) and (2 $\bar{1}$ 10) and this is possibly due to the presence of spiral dislocations, the axes of which are normal to the respective atomic planes of the hexagonal lattice. There are 8 figures and 23 references, 7 of which are Soviet, 7 German, 9 English.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskii institut AN SSSR  
(Leningrad Physico-Technical Institute, Ac.Sc., USSR)

SUBMITTED: November 9, 1956

1. Zirconium--Transformations
2. Zirconium crystals--Lattices
3. Single crystals--Physical properties
4. Electron microscopy

Card 6/6

AUTHOR:  
TITLE:

KOMAR, A.P., SHREDNIK, V.N.

Investigation of the Allotropic Transformation  $\alpha \rightarrow \beta$  Zr with the Aid of an Electronic Projector. (Izucenie allotropiceskogo prevrascheniya  $\alpha \rightarrow \beta$  Zr pri pomoschi elektronogo projektora, Russian).

PERIODICAL:

Zhurnal Eksperimental'noi i Teoret. Fiziki, 1957, Vol 32, Nr 1, pp 184-184 (U.S.S.R.)  
Received: 3 / 1957

Reviewed: 4 / 1957

ABSTRACT:

The use of an electron projector permits the visual measuring of phase transformations on small crystals of the order of from  $10^{-4}$  to  $10^{-5}$  cm in the case of a resolving power of 100 - 20 Å. The investigation of the transformation in such small crystals is in itself interesting because with these dimensions the surface energy must exercise growing influence on transformations. The present work makes use of the usual electron projector developed by MUELLER, which has a zirconium point the monocrystalline end of which served as a test object. The quality of the vacuum was of particular importance because the oxides, nitrides, or carbides which possibly form with heating, are presenting difficulties with regard to melting and volatility, and therefore do not leave the point in the vacuum.

Card 1/3

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Investigation of the Allotropic Transformation  $\alpha \rightleftharpoons \beta$  Zr with the Aid of an Electronic Projector.

2) Condensation of large quantities of zirconium from a foreign source on the surface of the zirconium point in a vacuum of the order of  $10^{-8}$  torr. On the occasion of the heating of the point beyond transformation temperature ( $862^{\circ}$  C) a  $\beta$ -Zr crystal is formed which is transformed in its entire volume into a uniform crystal of  $\alpha$ -Zr when cooled. The  $\beta$ - $\alpha$  transformation process is not always geometrically reversible. On the occasion of  $\beta \rightarrow \alpha$ -transition 12, and in the case of  $\alpha \rightarrow \beta$  transition 6 orientations of the new phase may occur. However, experiments showed that in the case of the observed monocrystals usually one (more rarely two) of the possible orientations of the new phase could be realized. If heating was carried out over a longer period, transformation temperature rose noticeably.

ASSOCIATION: Leningrad Physical-Technical Institute of the Academy of Sciences of the USSR

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress

Card 3/3



KOMAR, A. and SHCHEDNIK, V.

"The Investigation of Phase Transformation."

paper ~~XXXXXX~~ submitted for presentation at Fourth Intl Conference on Electron Microscopy, Berlin, GFR, 10-17 Sep 58.

Physical Technical Institute, USSR Academy of Sciences, Leningrad.

C-3,800,829, 25 Jul 58.

AUTHOR: Shrednik, V. N.

48-22-5-15/22

TITLE: Zirconium and Barium Adsorption on Tungsten and the Electron Work Function (Adsorbtsiya tsirkoniya i bariya na vol'frame i rabota vykhoda elektronov) Data on the VIII All Union Conference on Cathode Electronics, Leningrad, October 17-24, 1957 (Materialy VIII Vsesoyuznogo soveshchaniya po katodnoy elektronike, Leningrad, 17-24 oktyabrya 1957 g.)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1958, Vol. 22, Nr 5, pp. 594 - 604 (USSR)

ABSTRACT: The method of field electron microscope (Reference 1) permits a visual observation of surface processes of an order of magnitude of  $10^5$  and at a resolving power of 40-50 Å. It led already to a realization of very fine phenomena on the surface of monocrystals. The Zr-W-system has never been included in these possibilities of examination. A short review of literature follows. Only the part of the paper concerning mainly the change of emission properties of the not warmed-up condensate of Zr on W at increasing Zr concentrations<sup>1</sup> explained. The experiments with Ba on W have been carried out only qualitatively by way

Card 1/4

Zirconium and Barium Adsorption on Tungsten and the  
Electron Work Function

48-22-5-15/22

of comparison as something is already known about it (Reference 2,4,5,9). The method applied gives no guarantee for an exact determination of the absolute values of  $\varphi$  for tungsten, as the surface may have contained an admixture of zirconium. Nevertheless the work function determined according to formula (2)  $\varphi_x = \varphi_W \left( \frac{\lg \beta_x}{\lg \beta_W} \right)^{2/3}$  gives a more reliable characteristic of the real than the voltage required for the prescribed current. Further the author determines the average autoemission-work-function

$$\varphi^{3/2} = \frac{\int_S j \varphi^{3/2}(x,y) dS}{\int_S j dS} \quad (3).$$

For the need of an expenditure of energy to form a layer with a minimum work function two explanations are possible: 1) In

Card 2/4

Zirconium and Barium Adsorption on Tungsten and the  
Electron Work Function

48-22-5-15/22

the case of an atom adsorption on a "cold" surface, and if the atoms have no possibility to move away, the forming of a second layer will begin before the first layer is filled. Even in assuming that the second layer will be formed only after the completion of the first layer, the first adsorbed layer cannot produce a maximum admissible packing without a free displacement of atoms on the surface, if the radius of the latter is bigger than the minimum distance between the adsorption points (Reference 8). In a statistical impact of atoms upon the lattice the "Blackfield" as well as the "White-field-spot phase" will be formed (figure 8). At the points of contact of these spots boundaries will occur with a lesser density of the adsorbed layer. At a temperature rise, especially at a presence of atoms of the second layer which are more movable than those of the first layer, a movement of the boundaries and a fusion of the spots belonging to the same phases is possible. II. The other surmise does not require the assumption that the minimum of the work function  $\phi = 1$ . A partial ionisation is purely of a quantum nature (References 19,20). It can be assumed that Zr-atoms

Card 3/4

Zirconium and Barium Adsorption on Tungsten and the  
Electron Work Function

48-22-5-15/22

adsorbed on the W surface are at room temperature not or only slightly ionised. A. P. Komar discussed the results of the work and Yu. N. Talanin added several critical remarks to the text. In the discussion concerning this paper N. D. Morgulis, I. L. Sokol'skaya, G. N. Shuppe, M. I. Yelinson and the author took part. There are 7 figures and 20 references, 8 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhicheskiy institut Akademii nauk SSSR  
(Leningrad Physical-Technical Institute AS USSR)

1. Zirconium--Adsorption 2. Barium--Adsorption 3. Tungsten--Ad-  
sorptive properties 4. Work functions 5. Electron microscopes  
--Applications

Card 4/4

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SOV/181-1-7-18/21

~~24(6)~~ 9.3120

AUTHOR: Shrednik, V. N.

TITLE: On the Deciphering of Autoemission Images of Metal Film Cathodes

PERIODICAL: Fizika tverdogo tela, 1959, Vol 1, Nr 7, pp 1134-1139 (USSR)

ABSTRACT: The luminosity distribution of autoemitting images in electronic projector depends on the distribution of the electronic work function as well as on the distribution of the local electric field intensity on the surface of the object in question. 4 possible kinds of experimental procedure are proposed to measure the effect of these 2 factors in an investigation of film cathodes in a projector. The 4 methods are: 1) Method of additional vaporized metal coating. 2) Use of electronic thermo-autoemission. 3) Record of the face by the "craters" formed in its neighborhood. 4) Use of the lattice reconstruction in an electric field. The emission images of the systems Zr-W and Ba-W are represented by photographs in figures 1 and 3 (the vaporizing of Zr or Ba took different times and was followed by special treatment of the vaporized coat) and were analyzed by different methods. Academician of the AS UkrSSR A. P. Komar and Docent G. N. Shuppe took interest in this work and gave valuable advices.

Card 1/2

Effect of residual stresses on the limit of fatigue in tempered steel. Yu. A. Geller and G. K. Shreber. *Tr. Akad. Nauk SSSR, Fiz. Met. i Metal.* (U. S. S. R.) 11, 700 (1961).—The steel contained 0.45% C, 0.45% Mn, 0.29% Si and 0.17% P. It was tempered to fine-grained pearlite and had Brinell hardness 182. (1) Dets. of residual stresses were made on prismatic rods  $13 \times 15 \times 60$  mm.; the specimens were quenched from 820°, 835° and 850°; corresponding a.mts. of residual stresses were 5%, 7% and 9%; Rockwell hardness  $R$  (Scale C) was from 62.5 (820°) to 64 (850°). Distribution of residual stresses: compression, 10–20 kg./sq. mm., in the central zone around the axis, about 1 mm. thick; extension in the intermediate zone, 1–4 mm. from center, about 30 kg./sq. mm. at about 2.5 mm. from axis of specimen; once more passing through zero and taking the sign of compression, max. at the outer surface (0 mm. from axis), 30 kg./sq. mm. when quenched from 820°, 35 kg./sq. mm. (from 835°), 42 kg./sq. mm. (from 850°). With quenching from 835° and tempering at 150°, 165°, 180°, 190° and 200°, for 1, 3 and 5 hrs., austenite drops from 7% (150°) to 5% (200°, 1 hr.); after 1 hr., 150°,  $R$  from 63 (150°) to 60 (200°, 1 hr.); after 1 hr., 150°, 0.4–0.5% C is in soln.; after 1 hr. at 250°, there is still 0.25% C in soln. Distribution of stresses along the cross-section is qualitatively the same as in the nontempered specimen; for 180°, 2 hrs., in the center compression 8 kg./sq. mm.; middle zone, max. extension 8 kg./sq. mm.; surface, compression 12 kg./sq. mm. At 150°, extension of tempering beyond 2–3 hrs. does not result in any further change of the stress at the surface which remains at about 80% of that corresponding to the specimen quenched from 835°; rise of temp. is much more efficient than time; thus, tempering at 180° for 1 hr. reduces the ultimate

stress more efficiently than 2 hrs. at 165° or 5 hrs. at 150°. (2) The fatigue endurance limit  $L$  was detd. by alternating flexion tests on cylindrical specimens at 4000 revolutions per min. For specimens quenched from 820°, 835° and 850°, uniformly tempered at 150°, 1 hr., the values of  $L$  are found, resp., to be 50, 65, 50 kg./sq. mm.,  $R$  62, 63.5 and 61.0; quenching uniformly from 835° and 1–3 hrs. varying the conditions of tempering (150–180°, 1–3 hrs.) only results in some straggling of  $L$  and  $R$ . There is obviously no parallelism between the dependence of  $L$  on thermal treatment and the behavior of residual stresses; this contradicts the conceptions of Thum. Fatigue endurance is merely detd. by the structure obtained as a result of quenching,  $L$  being max. for crys. interval 150°–180° and carbides; tempering in the temp. interval 150°–180° does not affect the structure, although it has a marked effect on the relaxation of stresses. Results obtained with specimens with rectangular cross-sections are not comparable with those found with cylindrical specimens. N. Thon

"The Machinability of Alloyed Structural Steel." Stanki I Instrument Vol.15, No. 3,  
1944

BR 52059019



SHREYBER, G. K.

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1-4E2C  
✓ Protection of the steel from hydrogen sulfide corrosion.  
V. D. Taras, O. K. Shchepet, and D. A. Kozlov. *Trudy  
Nef. Inst. im. I. M. Gubkina* 1964, No. 12, 231-44. — The  
method is based on metallizing the surface of steel with  
Al and then anodizing Al in the bath contg. 20% H<sub>2</sub>SO<sub>4</sub>  
with c.d. of 1 amp./sq. dm. for 20 min. The samples coated  
by the proposed method showed high resistance to the H<sub>2</sub>S  
atm. at 300-500° and to the oxidizing medium up to 700°.  
The equipment employed, methods, and possible difficulties  
in deposition are reviewed. M. Charmsadarian

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SHREYBER, G. K.

Vinogradov, V. N., E. L. Markhasin, and G. K. Shreyber.

"Optimal Content of Carbon in Steel Used for Cutters of Rock Bits"

Problems of Petroleum Production and Petroleum Engineering, Moscow, Neftyanoy  
institute, Gostoytekhizdat, 1957, 393pp. (Study vop. 25)  
This book is a collection of articles written by professors and faculty members  
of the Petroleum Inst. in I. M. Gubkin.

VINOGRADOV, V.N., kand.tekhn.nauk; MARKHASIN, E.L., kand.tekhn.nauk;  
SHREYBER, G.K., kand.tekhn.nauk

Optimum carbon content of steel suitable for manufacturing cone  
bits. Trudy MNI no.20:165-171 '57. (MIRA 13:5)  
(Boring machinery) (Steel--Analysis)

MALINKINA, Yevdokiya Il'inishna, kand. tekhn. nauk; SHRAYBER, G.K., dots.,  
red.; MODEL', B.I., tekhn. red.

[Crack formation during heat treatment of steel] Obrazovanie  
treshchin pri termicheskoi obrabotke stali. Moskva, Gos.  
nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1958. 159 p.  
(Steel--Heat treatment) (MIRA 11:9)

TARAN, V.D., prof., doktor tekhn.nauk; SHREYBER, G.K., dotsent, kand.  
tekhn.nauk; SKUGOROVA, L.P., kand.tekhn.nauk; SAAKIYAN, L.S.,  
assistant, kand.tekhn.nauk; DUDA-ZAKSON, R.I., kand.tekhn.nauk;  
POLFEROV, A.P., inzh., starshiy prepodavatel'.

[Studying the materials used in the petroleum industry] Neftianoe  
materialovedenie. Pod obshchei red. V.D.Tarana. Moskva, Mosk.  
in-t neftekhim. i gazovoi promyshl. Pt.1. [Steel and cast iron]  
Stali i chuguny. 1959. 179 p. (MIRA 13:1)  
(Steel) (Cast iron)

MARKHASIN, Emanuil L'vovich, dotsent, kand.tekhn.nauk [deceased]; SHREYBER, Gennadiy Konstantinovich, dotsent, kand.tekhn.nauk; SVYATITSKAYA, K.P., vedushchiy red.; POLOSINA, A.S., tekhn.red.

[Surface hardening of machine and equipment parts for the petroleum industry] Poverkhnostnoe uprochnenie detalei neftiyanogo oborudovaniia i instrumenta. Moskva, Gos.nauchno-tekhn.izd-vo nef. i gorno-toplivnoi lit-ry, 1959. 179 p. (MIRA 12:5)  
(Hard facing) (Petroleum industry--Equipment and supplies)

PRIDANTSEV, Mikhail Vasil'yevich; LANSKAYA, Kseniya Alekseyevna; SHREYBER,  
G.K., red.; BERLIN, Ye.N., red.izd-va; ISLENT'YEVA, P.G., tekhn.red.

[Steels for constructing boilers] Stali dlia kotlostroeniia..Moskva,  
Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii,  
1959. 303 p. (MIRA 12:3)  
(Steel, Structural) (Boilers)

S/129/61/000/004/010/012  
E073/E535

AUTHORS: Shreyber, G. K., Candidate of Technical Sciences and  
Kan, A., Engineer

TITLE: Residual Stresses During Surface Hardening of Steel

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov,  
1961, No.4, pp.44-49

TEXT: The authors attempted to determine analytically the magnitude and the character of residual stresses which arise during surface hardening in various zones of a cylindrical steel specimen. The residual thermal stresses in a solid cylindrical specimen can be determined by means of the following approximate formulae.

1. Hardened zone:

$$\sigma_{p_s} = \frac{\alpha TE}{4(1-\mu)} \left( 1 + \frac{R_n^2}{R^2} - \frac{r^2}{R^2} - \frac{R_n^2}{r^2} \right), \quad (1)$$

$$\sigma_{T_s} = -\frac{\alpha TE}{4(1-\mu)} \cdot \left( 3 \frac{r^2}{R^2} - \frac{R_n^2}{r^2} - \frac{R_n^2}{R^2} - 1 \right), \quad (2)$$

Card 1/10



S/129/61/000/004/010/012  
Residual Stresses During Surface.... E073/E535

$$\sigma_{\theta\theta} = -\frac{\alpha TE}{2(1-\mu)} \left( 2 \frac{r^2}{R^2} - \frac{R_n^2}{R^2} - 1 \right). \quad (3)$$

2. Transition and Unhardened zones:

$$\sigma_{rr} = -\frac{\alpha TE}{4(1-\mu)} \times \frac{R^2 - R_n^2}{R^2} \left( 1 - \frac{r^2}{R_n^2} \right), \quad (4)$$

$$\sigma_{T_n} = \frac{\alpha TE}{4(1-\mu)} \times \frac{R^2 - R_n^2}{R^2} \left( 3 \frac{r^2}{R_n^2} - 1 \right), \quad (5)$$

Card 2/10

Residual Stresses During Surface....

S/129/61/000/004/010/012

E073/E535

$$\sigma_{oc_n} = \frac{\alpha TE}{2(1-\mu)} \cdot \frac{R^2 - R_n^2}{R^2} \times \left( 2 \frac{r^2}{R_n^2} - 1 \right), \quad (6)$$

In these equations  $\sigma_r$ ,  $\sigma_T$  and  $\sigma_{oc}$  are, respectively, the radial, tangential and axial stresses,  $\alpha$  - coefficient of linear expansion,  $\mu$  - Poisson coefficient,  $E$  - Young's modulus,  $T$  - temperature difference between the internal and external layers of the cylinder,  $R$  - radius, as shown in Fig.1. In deriving these formulae the following assumptions were made:

1. Cooling is only from the external surface of the specimen;
2. the temperature distribution in the heated layer is symmetrical relative to the axis of the cylinder and is constant along its length;
3. the magnitudes of the axial deformations, which are sufficiently distant from the end faces, are the same and equal the relative axis deformation of a specimen of unit length;
4. the values of  $\mu$ ,  $\alpha$  and  $E$  in the range of elastic deformations are independent of the temperature.

Card 3/10

Residual Stresses During Surface.... S/129/61/000/004/010/012  
E073/E535

Analysis of the above formulae indicates that, during surface hardening of cylindrical components, the stresses in the surface will always consist of axial compression stresses and tangential residual thermal stresses, the magnitude of which depends on the thickness of the heated layer and its temperature. Fig.2 gives the dependence of the maximum tangential thermal residual stresses at the surface of the specimen as a function of  $F_z/F$  and  $\alpha T$ . G. F. Golovin and M. M. Zamyatnin (Ref.3) have determined experimentally the total residual tangential stresses in 65 mm diameter specimens of Steel 45 after induction hardening to a depth of 6 mm and low temperature tempering; their results are reproduced in Fig.4. The results of approximate analytical and experimental determination of the stresses during surface hardening to a depth of 7 mm are reproduced in Fig.5. In another paper Golovin determined the total residual tangential stresses in a specimen ( $R = 32.5$  mm) hardened to a depth of 5.5 mm. He determined the values  $R_n$  and  $R_c$  at 29 and 24.5 mm, respectively, from the hardness distribution curve along the cross-section. Comparison of the calculated results with experimental data are given in Fig.6. It is concluded that the

Card 4/10.

Residual Stresses During Surface.....

S/129/61/000/004/010/012  
E073/E535

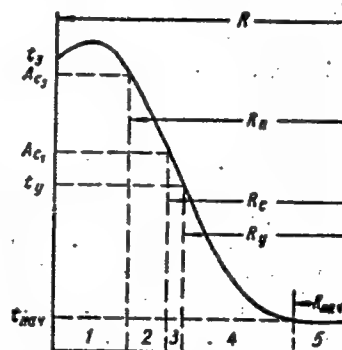
total stresses occurring during induction surface hardening can be determined with adequate accuracy by means of approximate analytical formulae. There are 6 figures and 8 references: all Soviet.

ASSOCIATION: Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti (Moscow Institute of the Petrochemical and Gas Industries)

Fig.1. Legend:

Sketch of the temperature distribution along the cross section of a steel cylindrical specimen heated for surface hardening ( $t_v$  - temperature at which the metal loses its elastic properties).

$t_{H04} - t_{initial}$ ,  $R_{H04} - R_{initial}$



Card 5/10

SHREYBER, G.K.; KAN, A.G.

Residual stresses in induction hardening of steel. Trudy  
MINKHIGP no.34:31-58 '61. (MIRA 14:12)  
(Steel--Hardening)  
(Thermal stresses)

VINOGRADOV, V.N.; SHREYBER, G.K.; SOROKIN, G.M.

Interaction between the roller teeth of a drill bit and the well  
bottom. Trudy MINKHIGP no.35:8-13 '61. (MIRA 14:11)  
(Boring machinery)

SHREYBER, Gennadiy Konstantinovich, dots., kand.tekhn.nauk;  
SHIBRYAYEV, Boris Filippovich, dots. kand. tekhn. nauk;  
POLFEROV, Aleksandr Pavlovich, dots.; PERLIN, Samuil  
Mendeleyevich, inzh.; RASTOVA, G.V., ved. red.; VORONOVA,  
V.V., tekhn. red.

[Building materials in the petroleum, petrochemical, and gas  
industries] Konstruktsionnye materialy v neftyanoi, nefte-  
khimicheskoi i gazovoi promyshlennosti; spravochnoe rukovod-  
stvo. [By] G.K. Shreiber i dr. Moskva, Gostoptekhizdat, 1962.  
381 p. (MIRA 16:3)

(Building materials) (Chemicals industry)  
(Petroleum industry)

VINOGRADOV, V.N.; SHREYBER, G.K.; SOBOLEV, D.Ya.

Certain regularities in the abrasive wear of plastics. Izv.vys.ucheb.  
zav.;neft' i gaz 6 no.11:102-105 '63. (MIRA 17:9)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti  
imeni akademika I.M.Gubkina.



VINOGRADOV, V.N.; SHREYBER, G.K.; SOROKIN, G.M.

New steel for the production of bit rollers. Trudy MINHIGP  
46:101-104 '64. (MIRA 17:6)

SHREYBER, G.K.; ARSEN'YEVA, L.N.

Method for testing the fatigue strength of glass-reinforced  
plastic obtained by winding. Trudy MINKHIGP 46:228-234 '64.  
(MIRA 17:6)

VINOGRADOV, V.A.; KRYZHEV, G.K.; GOLIKIN, G.M.

Steel for the manufacture of small bit rollers. Izv. vys.  
zav. neft' i gaz 7 no.6:73-78 '64. (MIRA 17:9)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promysh-  
lennosti imeni akademika Gubkina.

VINOGRADOV, V.N.; SHREYBER, G.K.; SOROKIN, G.M.

Wear and failure of the teeth of bit rollers. Izv. vys. ucheb. zav.;  
neft' i gaz 7 no.7:95-99 '64. (MIRA 17:9)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti  
im. akad. I.M. Gubkina.

SHREYBER, G.K.; YEFREMOV, N.M.

Laboratory methods for testing the supports of drilling bits  
for durability. Mash. i neft. obor. no.10:9-10 '64 (MIRA 18:1)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promysh-  
lennosti im. akademika I.M. Gubkina.

SHREYBNR, G.K.; KRESHINBAUM, V. Ya.

Bench for testing glass plastic pipes for fatigue strength.  
Mash. i nef. sbor. no.10s17-19 '64 (MIRA 18:1)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. akademika Gubkina.

VINOGRADOV, V.N.; SHREYBER, G.K.; SOBOLEV, N.Ya.

Wear of glass plastics during abrasion with loose abrasives.  
(MIRA 18:4)  
Khim.massy no.6:41-44 '64.

VINOGRADOV, V.N.; SHREYBER, G.K.; SOROKIN, G.M.

Investigating wear and failure of the teeth of bit rollers.  
Neft. khoz. 42 no.7:14-17 J1 '64. (MIRA 17:8)



L 40998-65 EWT(d)/EWP(e)/FPA(a)-2/EWT(m)/EWP(w)/EPF(o)/EWP(1)/EWA(d)/EWP(T)/  
EPR/EWP(j)/T/EWP(k)/EWP(h)/EWP(b)/EWP(l)/EWA(h) P6-4/Pa-4/Pf-4/Pr-4/Ps-4/  
ACCESSION NR: AR5005646 S/0081/64/000/022/8056/8056

Pt-10/Peb WW/EM/RM/WH  
SOURCE: Ref. zh. Khimiya. Abs. 228376

AUTHOR: Shreyber, G.K.; Arsen'yeva, L.N.

TITLE: Technique of determining the fatigue strength of glass reinforced plastics prepared by the winding method/

CITED SOURCE: Tr. Mosk. in-t neftekhim. i gaz. prom-sti. vyp. 46, 1964, 228-234

TOPIC TAGS: fiberglass, glass reinforced plastic, fatigue strength, glass plastic mechanical property, polyester resin, aluminoborosilicate fiberglass, strength test

TRANSLATION: The fatigue strength of glass reinforced plastics prepared from polyester resin PN-1 with an alkali-free aluminoborosilicate fiberglass in the form of a braid as a filler was studied on a modified MUI-6000 machine. The tests were carried out on round tubular samples with a thickening at the ends so that they could be fastened in the machine. The samples were prepared by winding a glass braid, which had been soaked with resin, on a rotating metallic road. The tests showed that the strength of the glass reinforced plastic increased with an increase in the number of longitudinal reinforcing layers in the

Card 1/2

L 40998-65

ACCESSION NR: AR5005646

sample. The technique of preparing the sample from glass reinforced plastic and of carrying out the tests is described. Z. Ivanova

ENCL: 00

SUB CODE: MT

Card <sup>ps</sup> 2/2

SHREIBER, G.K.; SANKIYAN, L.S.; ADIL' BOSHRA NASR

Investigating the corrosion resistance of anodized aluminum alloys suitable for the aggressive media in the petroleum and petrochemical industry. Izv. vys. ucheb. zav.; neft' i gaz 7 n.12:31-33 '64 (MIRA 18:2)

I. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti in. akademika I.M. Gubkina.

POGODIN-ALEKSEYEV, G.I., doktor tekhn. nauk, prof., otv. red.;  
RAKHSHTADT, A.G., kand. tekhn. nauk, dots., nauchn. red.;  
SHREYBER, G.K., kand. tekhn. nauk, dots., nauchn. red.;  
BERNSHTEYN, M.L., doktor tekhn. nauk, red.; LAKHTIN, Yu I.,  
doktor tekhn. nauk, prof., red.; RUSTEM, S.L., kand. tekhn.  
nauk, dots., red.; FEDOTENKO, N.S., inzh., red.

[Study of metals and their heat treatment] Metallovedenie i  
termicheskaya obrabotka. Moskva, Mashinostroenie, 1964.  
195 p. (MIRA 18:7)

1. Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy  
promyshlennosti. Sektsiya metallovedeniya i termicheskoy  
obrabotki.

L 3787-66 EWT(d)/EWT(m)/EWP(w)/EPF(c)/EWP(v)/EWP(j)/T/EWT(k)/EWP(l)/ETC(m)  
 ACCESSION NR: AP5023216 WW/EM/DJ/RM UR/037-65/000/004/0151/0153  
 070:520.1.051

AUTHOR: Shreyber, G. K. (Moscow); Gol'dshteyn, I. I. (Moscow)

TITLE: Investigation of long-term static strength of fiber-glass plastics in oil media

SOURCE: Mekhanika polimerov, no. 4, 1965, 151-153

TOPIC TAGS: fiberglass, reinforced plastic, structural plastic, static load test, static test, endurance test

ABSTRACT: A unit is described for testing endurance of fiber-glass reinforced plastics subjected to continual static load in oil media. The loads are applied uniaxially. The unit is provided with a special deformation recording device. The breaking point of a fiber-glass reinforced plastic may be determined with an accuracy of up to one minute. The overall accuracy of this testing unit is at least 98%. The schematic diagram of the testing unit is shown in fig. 1 of the Enclosure. Orig. art. has: 2 figures.

ASSOCIATION: none

SUBMITTED: 25Mar65

ENCL: 01

NO REF SOV: 006

SUB CODE: MT,

OTHER: 000

Card 1/2

L 3787-66

ACCESSION NR: AP5023216

ENCLOSURE: 01

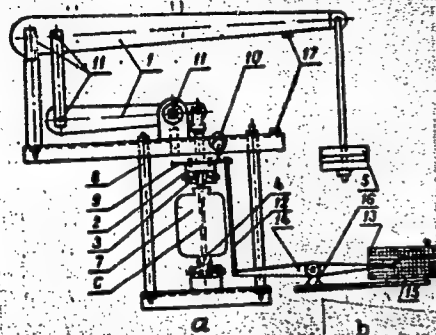


Fig. 1. Testing unit:  
(a)--the unit itself, (b)--  
the deformation recorder:  
1--arm system; 2--iron clamp;  
3--chuck jaw; 4--plastic bottle-  
neck; 5--load; 6--sample; 7--  
glass vessel, 8--casing; 9--  
fixed board; 10--ICh-10 indi-  
cator; 11--bearing; 12--pull  
rod; 13--drum; 14--recorder  
pen; 15--clock mechanism; 16--  
stand; 17--contacts.

CC  
Card 2/2

ACC NR: L 10292-66 EWP(e)/EWT(m)/EWI  
 AT5028827 JD/WH/WB/RM/WH SOURCE CODE: 001  
 AUTHORS: Shreyber, G. K.; Arsen'yeva, L. N.  
 ORG: Moscow Institute of Petrochemical and Gas Industry (Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti)  
 TITLE: Influence of the medium on the fatigue strength of laminated glass-reinforced plastic materials  
 SOURCE: Moscow. Institut neftekhimicheskoy i gazovoy promyshlennosti. Trudy, no. 54. 1965. Oborudovaniye neftegazovoy i neftekhimicheskoy promyshlennosti (Equipment of the petroleum-gas and petroleum-chemical industry), 117-120  
 TOPIC TAGS: laminated plastic, reinforced plastic, plastic strength, vinyl plastic, polyester plastic, fatigue strength, fatigue test/ PN 1 binder  
 ABSTRACT: The effect of several media on the fatigue strength of braided or laminated glass-reinforced plastics was studied. The media were: air, sea water, distilled water, gasoline "kalosha," and petroleums with 2.8% and with 0.3% sulfur content respectively. The specimens consisted of 30 alternate layers of continuous alkali-free glass fibers and polyvinylacetate. The alternate layers were bonded to  
 Card 1/3



L 10292-66

AGC NR: AT5028827

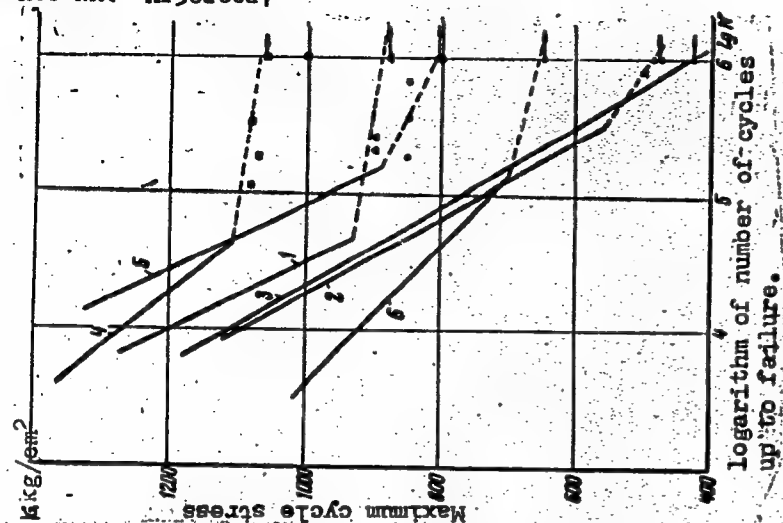


Fig. 1. Fatigue diagrams for laminated glass-reinforced plastic acted upon by different media.  
1 - air; 2 - sea water; 3 - distilled water; 4 - gasoline "kalosha"; 5 - low-sulfur petroleum; 6 - high-sulfur petroleum.

was 20% higher than in air. Orig. art. has: 1 table and 1 graph.

SUB CODE: 11/

SUBM DATE: none/

ORIG REF: 007

Card 3/3

PC



SHREYBER, G.K.; SAAKIYAN, L.S.; ZUBKOVA, L.F.

Using anodized aluminum alloys for manufacturing the  
equipment of gas condensate wells. Gaz.delo no.11:12-15  
'65. (MIRA 19#1)

1. Moskovskiy ordena Trudovogo Krasnogo Znameni institut  
neftekhimicheskoy i gazovoy promyshlennosti im. akademika  
Gubkina.

L 44398-66 EWT(m)/EWP(t)/ETI IJP(c) JD/WB  
 ACC NR: AP6024526 SOURCE CODE: UR/0148/66/000/007/0114/0118

AUTHOR: Shreyber, G. K.; Zhetbin, N. P.; Saakiyan, L. S.; Laisova, I. Ya.

ORG: Institute of the Petrochemical and Gas Industry (Institut neftekhimicheskoy i gazovoy promyshlennosti)

TITLE: The influence of deformation on intercrystalline corrosion of type 18-8 stainless steel

SOURCE: IVUZ. Chernaya metallurgiya, no. 7, 1966, 114-118

TOPIC TAGS: annealing, metal deformation, stainless steel, corrosion resistance, metal grain structure, magnetic saturation / 2Kh18N9 steel

ABSTRACT: The effect of preliminary deformation and tempering on intercrystalline corrosion of 18-8 stainless steel was studied. 2Kh18N9 steel was deformed, after annealing: 37, 15, 10 and 0% at +20 and -70°C. All wire samples were subsequently annealed at 550 and 650°C for 2, 4 and 8 hrs. The amount of  $\alpha$ -phase present was determined on a magnetometer. By lowering the deformation temperature to -70°C, greater amounts of  $\alpha$ -phase formed. The magnetic saturation increased rapidly after 10% deformation, the more so for unannealed specimens. Samples were boiled for 24 hrs in a standard solution (160 g  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ , 100 ml  $\text{H}_2\text{SO}_4$  of density 1.84 g/cm<sup>3</sup> in 1000 ml of water in the presence of copper chips). After boiling, samples were measured for

UDC: 669.14.018.8-12:620.196

Card 1/2

SHREYBER, G. L., KASSIL, G. N., VAYSFELD, I. L., MATLINA, E. SH.,  
SOKOLINSKAYA, R. A., UGOLEVA, S. V. (USSR)

"Biochemical Mechanism of Physiological and Pathological Reactions  
of an Organism of the Introduction of Certain Hormone Preparations."

Report presented at the 5th International Biochemistry Congress,  
Moscow, 10-16 Aug 1961

SHREYBER, K.S.; GRINBERG, I.F., red.; EL'KINA, E.M., tekhn. red.

[Capital construction in light industry] Kapital'noe.  
stroitel'stvo v legkoi promyshlennosti. Moskva, Gizleprom,  
1949. 127 p. (MIRA 15:4)  
(Building—Contracts and specifications)

Shreyber, K. Ya.

137-1958-2-2620

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 2, p 59 (USSR)

AUTHORS: Babadzhan, A. A., Shreyber, K. Ya., Galimov, M. D.

TITLE: Using Mazut as a Reducing Agent in the "Pyroselection" Process  
(Ispol'zovaniye mazuta v kachestve vosstanovitelya v protsesse  
piroselektzii)

PERIODICAL: Byul. tsvetn. metallurgii, 1957, Nr 13, pp 27-28

ABSTRACT: A pyrometallurgical selection method for the treatment of  
Cu-Zn and Cu-Pb sulfide concentrates and other complex multi-  
metal substances in concentrates has been worked out and intro-  
duced into industry.

G. S.

1. Copper alloys--Pyroselection    2. Mazut--Reducing agent--Appli-  
cations

Card 1/1

136-58-3-7/ 21

AUTHORS: Babadzhan, A.A., Aglitskiy, V.A., Shreyber, K.Ya., Galimov, M.D. and Shirinkin, N.A.

TITLE: System for feeding coal dust into a converter used for pyroselection (Sistema podachi ugol'noy pyli v konverter dlya protsessy pirolektsii)

PERIODICAL: Tsvetnyye Metally, 1958<sup>3/</sup>, Nr.3., pp. 38 - 46 (USSR)

ABSTRACT: The authors describe preliminary investigations at the Kirovgradskiy copper-smelting works before the adoption of its pyroselection method which involves the injection into the converter of coal dust at a fixed rate in relation to the air flow (pressure 0.7 - 1.0 atm. gauge). The initial system involved pressurization of the bunker, but later an atmospheric pressure design, as tested at the Krasnoural'sk copper-smelting works was adopted and incorporated in the full-scale installation commissioned in August 1955. The installation (fig.1.) consists of the following parts, each of which is described and discussed. The pneumatic screw pump has an adjustable speed of revolution and a pump (fig.2.), the latter being based on one made by the Pavshinskiy mechanical works; a KSE-6 compressor supplies compressed air. The air/dust mixture (5-10 kg coal dust per kg air) moves to the converter at 12-15 m/sec. A critical part of the installation is the air and gas distribution system near and in the converter: here a blind-pass collector (fig.4) proposed by N.A. Shirinkin, M.D. Galimov and A.A. Babadzhan, and designed with the

Card 1/2

System for feeding coal dust into a converter used for pyroselection. 136-58-3-7/21

participation of M.D. Galimov, Ye.A. Verkhoturova and B.P. Smorodyakov was found to give even feed to all the tuyeres. An ejector type of tuyere with individual air and air/coal feeds, proposed and designed by M.D. Galimov, A.A. Babadzhan, B.P. Smorodyakov, S.Ya. Musikhin and A.A. Verkholetov was chosen (fig.7). To avoid air losses during tuyere clearing a ring seal designed by S.M. Popov, Engineer, is used. The authors recommend the system described for other processes requiring the injection of coal dusts into a fused mass. There are 7 figures.

AVAILABLE: Library of Congress.

1. Coal dust-Applications 2. Fuels-Control systems

Card 2/2

SHUMBA, M. I.

"Problems related to Improving the Qualifications of Middle Medical Personnel of City  
Sanitary and Epidemiological Stations," *Fel'dsher i Akusher.*, No. 8, 1949.  
Sanitation Doctor.



SHREYBER, M. I.

Public Health

Work of the epidemiologist's assistant in the municipal edipemiological station.  
Fel'd i. akush, no. 7, 1952

9. Monthly List of Russian Accessions, Library of Congress, October 1953,<sup>2</sup> Uncl.

LEBEDEV, A.A.; SHREYBER, M.I.

Organization of the work of the sanitation and epidemiological station.  
Gig.1 san. no.6:38-45 Je '53. (MLRA 6:6)

1. Orekhovo-Zuyevskaya gorodskaya sanitarno-epidemiologicheskaya stantsiya.  
(Public health)

SHREYBER, M.I.; LEBEDEV, A.A., glavnyy vrach.

Maintenance and method of current supervision of sanitation. Zhur.mikrobiol.  
epid.i immun. no.9:56-61 S '53. (MLRA 6:11)

1. Orekhovo-Zuyevskaya gorodskaya sanitarno-epidemiologicheskaya stantsiya.  
(Sanitation)

SHREYBER, M. I.

Problem of the content organization, and method of epidemiologic surveys. Zhur. mikrobiol. epid. i immun. no.1:87-92 Ja '54.

(MLRA 8:2)

1. Iz Orekhovo-Znyevskoy gorodskoy sanitarno-epidemiologicheskoy stantsii (glavnyy vrach A.A.Lebedev)

(EPIDEMIOLOGY,

in Russia epidemiol. surveys)

SHREYER, M.I.

Work experience of the urban epidemiological control station in  
controlling the quality of potable water. Gig.i san.no.2:43-47  
F '54. (MLRA 7:2)

1. Iz Orekhovo-Zuyevskoy gorodskoy sanitarno-epidemiologicheskoy  
stantsii. (Water--Purification)

SHREYBER, M.I.

Role of the sanitary physician in sanitary supervision of the condition of populated areas. Gig. i san., no.8:36-38 Ag '54. (MLRA 7:9)

1. Iz Orekhovo-Zuyevskoy gorodskoy sanitarno-epidemiologicheskoy stantsii.

(SANITATION,  
in Russia, supervision)

LEBEDEV, A.A.; SHREIBER, M.I.

Work organization at the public health and epidemiological station.  
(Transl. from Gig. & San., 1953. No.6, pp.38-45.) Nepegessegugy 35  
4:93-97 Apr.54.

(PUBLIC HEALTH,

in Russia, work organiz. at pub. health & epidemiol.  
stations)

SHREYBER, M. I.

"The Problem of the Content, Organization, and Methods of Epidemiological Investigations," Zhur. Mikrobiol., Epidemiol. i Immunobiol., No.1, pp 87-92, 1955

Translation M-1051, 30 Mar 56



STEKOL'SHCHIKOV, M.: SHREYBER, M.

Practice in organizing regular-planned city sanitation services.  
Zhil.-kom.khoz. 6 no.4:7-9 '56. (MLBA 9:8)

1. Zaveduyushchiy Orekhovo-Zuyevskim gorkomkhozom (for Stekol'-shchikov); 2. Sanitarnyy vrach Orekhovo-Zuyevskoy gorodskoy sanitarno-epidemiologicheskoy stantsii (for Shreyber).  
(Street cleaning)

SHRAYBER, M. I.

"The content and methods of current sanitary control (according to the experience of the Orekhovo-Zuyevskaya City Sanitary-Epidemiological Station.)"

Report submitted at the 13th All-Union Congress of Hygienists, Epidemiologists and Infectionists. 1959

SHREYBER, M.I., sanitarnyy vrach

Sanitary supervision of the cleaning of the Orekhovo-Zuevo area for  
six years. Gig. i san. 26 no.2:73-77 F '61. (MIRA 14:10)

1. Iz Orekhovo-Zuyevskoy gorodskoy sanitarno-epidemiologicheskoy  
stantsii.

(OREKHOVO-ZUYEVO ~~SANITATION~~)

KIRPICHNIKOV, A.A., kand.tekhn.nauk; SHREYBER, M.I., zasluzhennyy vrach  
RSFSR; SHCHERBAKOV, A.P.

Refuse-sorting and refuse-processing station in Orekhovo-Zuyevo.  
Gig. i san. 26 no.8:70-75 Ag '61. (MIRA 15:4)

1. Iz sektora sanitarnoy ochistki gorodov Akademii kommunal'nogo  
khozyaystva imeni K.D.Pamfilova i Orekhovo-Zuyevskoy gorodskoy  
sanitarno-epidemiologicheskoy stantsii.

(OREKHOVO-ZUYEVO--REFUSE AND REFUSE DISPOSAL)

SHREYBER, M.I.

Sanitary control for the use of underground waters in Orekhovo-Zuyevo. Nauch.trudy AKKH no.27:106-113 '64.

(MIRA 18:5)

LOPAREV, Ya.P.; KULAKOVSKIY, M.G.; VIL'NER, D., inzh.; BUTKEVICH, A.V.,  
kand.tekhn.nauk; STYCHKOV, M.I., starshiy fotolaborant;  
KRAMARENKO, V., starshiy tekhnik-stereotipograf; SHREYBER,  
N.V., inzh.

Readers' letters. Geod. i kart. no.9:65-73 S '58. (MIRA 11:10)

1. Glavnyy inzh. Yakutskogo aerogeodezicheskogo predpriyatiya (for Loparev).
  2. Glavnyy inzh. otryada No.78 Kazakhskogo aerogeodezicheskogo predpriyatiya (for Kulakovskiy).
  3. Sverdlovskoye aerogeodezicheskoye predpriyatiye (for Vil'ner).
  4. Novosibirskiy institut inzhenerov geodezii aerofotos"yemki i kartografii (for Butkevich).
  5. Moskovskoye aerogeodezicheskoye predpriyatiye (for Stychkov).
  6. Trest "Geotopos"yemka," (for Kramarenko).
  7. Novosibirskoye aerogeodezicheskoye predpriyatiye (for Shreyber).
- (Geodesy)                      (Cartography)

AUTHOR: Shreyber, N. V., Engineer at the SOV/6-58-9-19/26  
Novosibirsk AGP

TITLE: Mechanization of Shrub Clearing (Mekhanizatsiya rubki  
kustarnika)

PERIODICAL: Geodeziya i kartografiya, 1958, Nr 9, pp 73 - 73 (USSR)

ABSTRACT: This is a letter to the editor. The clearing of  
sighting lines in shrubs has hitherto been carried  
out manually. When combustion-motor-driven saws  
"Druzhba" became available this work could be mechanized.  
This article includes a picture of such a saw and a reference  
to the article by G.Vinogorov in the periodical  
"Lesnaia promyshlennost'" (Forest Economy) 1957, Nr 11.  
This article contained a description of the saw. It  
was designed by A.K.Moreyev, Superior Scientific  
Collaborator at the TsNIIME. It stood all tests success-  
fully, exhibiting a productivity in the clearing of  
shrubs three times greater than that attained by  
manual work. There is a figure.

Card 1/2

Mechanization of Shrub Clearing

SOV/6-58-9-19/26

ASSOCIATION: Novosibirskoye aerogeodezicheskoye predpriyatiye (Novosibirsk  
Aerial Surveying Authority)

Card 2/2



3 (4)

AUTHOR:

Shreyber, N. V.

SOV/6-59-5-18/26

TITLE:

On the Tent for Field Service Workers (O palatke dlya polevykh rabotnikov)

PERIODICAL:

Geodeziya i kartografiya, 1959, Nr 5, pp 51-52 (USSR)

ABSTRACT:

The requirements with regard to the tents of field brigades are the following: (1) The tent must be sufficiently spacious, it must house, not only the members of the brigade, but also instruments, equipment, personal belongings of the team, and by all means a stove. (2) The tent must be bright. For this purpose, the front walls should be made of white fabric. (3) In order to keep gnats out, the door must close well, and there must not be any other openings. - The tents in the northern territories of the Yakutskaya ASSR and in the Evenkiyskiy okrug and Dolgano-Nenetskiy okrug of the Krasnoyarskiy kray comply with these requirements. The most essential difference between these tents and others is constituted by the front wall with a well-closing door that will not admit gnats. Besides, the side walls are tilted. This tilt permits an increase in floor space. The frame consists of four poles. The design is illustrated in brief. A tent for

Card 1/2

On the Tent for Field Service Workers

SOV/6-59-5-18/26

four has the following dimensions: length, 280 cm (along the ridge), width, 300 cm (on the ground), and height, 215 cm to the ridge. - This type of tent cannot be used in open mountain regions, as, due to its large area, it is not sufficiently stable against stiff winds. In these regions, a tent for two would be appropriate. There is 1 figure.

Card 2/2





3(4)

AUTHOR:

Shreyber, .N..V.

SOV/6-59-9-10/19

TITLE:

Marking by Means of "Air" Signals

PERIODICAL:

Geodeziya i kartografiya, 1959, Nr 9, pp 39-42 (USSR)

ABSTRACT:

In May 1958, the opytno-issledovatel'skaya laboratoriya (Experimental Research Laboratory) of the Novosibirskoye aerogeodezicheskoye predpriyatiye (Novosibirsk Aerogeodetic Service) started testing a new method of marking fixed points in completely wooded areas. At the height of the three tallest trees, two nettle cloths, each measuring 0.7 by 6.5 m, were fixed under a nearly right angle. Such a signal can be well identified on aerial photographs on a scale of 1 : 7,000. As, however, flights for smaller scales had not been made, testing of the new marking method was continued in May 1959. Besides white nettle cloths signals of a cotton net with a mesh aperture of 2 by 2 mm were tested. This material was suggested by Chief Topographer Kh. Ya. Kolosov. The manufacture of these cloths is described. They were produced in Γ-form and in the form of squares. The experiments were carried out in a fir-wood 100 km south of Novosibirsk. The signals were

Card 1/2

Marking by means of "Air" Signals

SOV/6-59-9-10/19

distributed over a small area of the dense forest which was 20-25 m high. Fixing the cloths to the trees is described here. Recommendations for the type and quality of material are given. The aerial survey was made on a scale of 1 : 25,000. There are 3 figures.

Card 2/2

SHREYBER, H.V.

Attachments for steel ropes. Geod. 1 kart. no.9:54-63 S '60.

(MIRA 13:11)

(Wire rope) (Surveying) (Jigs and fixtures)

SHERBYBER, N.V.

Protection of pipe bench marks against heaving and corrosion.

Geod. i kart. no. 10:24-25 0 '60.

(MIRA 13:12)

(Bench marks)



SHREYBER, N.V.

Reconnoiterer's belt for work on trees. Geod. i kart. no.1:50-51  
Ja '61. (MIRA 14:9)

(Triangulation)

66262

SOV/181-1-7-18/21

On the Deciphering of Autoemission Images of Metal Film Cathodes

A report of this investigation was delivered at the 2nd Congress of Electro Microscopy held in Moscow on May, 1958. The investigation made by Andreyev is specially mentioned for comparative purposes. There are 3 figures and 9 references, 5 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskii institut AN SSSR (Leningrad Physics and Technical Institute of the AS USSR)

SUBMITTED: July 30, 1958

Card 2/2

*Brokhina, A.I.*

**AUTHORS:** Gor'kov, V.A.; Kofanova, T.I. SOV/109-4-6-27/27  
**TITLE:** Inter-departmental Seminar on Cathode Electronics  
 (13th Meeting) (Mezhvedomstvennyy seminar po katodnoy elektronike) (13-e zasedaniye) (New Item)  
**PERIODICAL:** Radiotekhnika i elektronika, 1959, Vol. 4, Nr. 6, pp 1067 - 1068 (USSR)  
**ABSTRACT:** The meeting of the seminar took place on February 2, 1959, at the Institut Radiotekhniki i Elektroniki AN SSSR (Institute of Radioengineering and Electronics of the Ac.Sc., USSR). The following lectures were delivered and discussed:  
 M.I. Yelinson - "Investigation of the Field Emission of Di-electrics Containing Admixtures";  
 A.Y. Frokhina - "Destruction of the Dielectrics Subjected to Ion Bombardment and Heating";  
 V.A. Shrednik - "Dependence of the Work Function of the Two-Layer Cathodes on the Coverage Region";

1 1/2

A.P. Ruyantsev - "Influence of the Temperature Processing on the Work Function of the Compounds Having High Melting Points".  
 The report gives comprehensive summaries of the lectures presented.

Card 2/2

~~18 (7), 24 (2)~~ 18.9100

66450

AUTHORS:

Komar. A. P., Academician, Academy of Sciences, Ukrainskaya SSR, Savchenko, V. P., Shrednik, V. N.

SOV/20-129-3-18/70

TITLE:

The Electron Autoemission Images of Crystals of Orderable Alloys

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 129, Nr 3, pp 540-543 (USSR)

ABSTRACT:

New methods ought to be developed for the production of electron-autoemission images of metals with a melting point of less than 1500°. The method suggested by A. J. Melmed and R. Gomer (Ref 1) is suited only for pure metals. The authors developed a simpler and more universal method for the production of electronic autoemitters, which are suited for various single-phase metallic systems with a melting point of less than 1500°. By means of the usual production process using a vacuum breakdown the authors obtained projections on the surface of the tip on which autoelectronic emission occurs. The projections having a height of some hundreds Å have good contact with the tip and are therefore easily heated. In metals or alloys which have a higher vapor pressure ( $p > p_{Ni}$ ) at room temperature, breakdown in the vacuum is easily produced.

Card 1/3

The Electron Autoemission Images of Crystals of  
Orderable Alloys

66450

SOV/20-129-3-18/70

Several figures show typical electron images recorded immediately after breakdown in the vacuum. The emission of electrons is the same for nearly all parts of the "pimples". In addition to the roughness of the surface, deep holes in the layers of the "pimples" occur on the surface. In the figures round, black spots correspond to these holes, which are displaced with the entire figure under the influence of a magnetic field. The homogeneity of the emission and the holes in the surface of the "pimples" show that the structure of the "pimples" within the limits of the resolving power of the electron projector is amorphous. Heating the points consisting of  $\text{Ni}_3\text{Mn}$  and  $\text{AuCu}_3$  alloys to 40 to 60°, signs of a crystallographical limitation of the "pimples" occur. The equilibrium images resulting from an intense heating of the alloys  $\text{Ni}_3\text{Mn}$ ,  $\text{AuCu}_3$ ,  $\text{PtCu}_3$  and the pure metals Ni and Au indicate that the "pimples" are well-bounded crystals. For the definite and final determination of the structure of the initial surface the authors intend carrying out investigations by means of an ion projector. In the alloy  $\text{Ni}_3\text{Mn}$  the diffusion

Card 2/3

66450

SOV/20-129-3-18/70

The Electron Autoemission Images of Crystals of  
Orderable Alloys

rate, the migration, and the volatility of Mn are very  
considerable. The surface of these alloys is, in general,  
covered with pure manganese. There are 3 figures and  
3 references, 1 of which is Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk SSSR (Physico-  
technical Institute of the Academy of Sciences, USSR)

SUBMITTED: July 15, 1959

Card 3/3

S/109/60/005/008/002/024  
E140/E555

26.2312  
9.3120 (1003, 1137, 1140)  
AUTHOR: Shrednik, V. N.

TITLE: Dependence of Film Cathode Work Function on Degree of Coating

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol.5, No.8, pp. 1203-1210

TEXT: It is shown that the generally accepted values of the so-called "optimal" adatom covering, corresponding to minimum work function, is not 0.7 but 1. The degree of coating is defined as the ratio of the concentration of atoms adsorbed at the surface to the surface density of the same adsorbate in a monolayer on a given crystallographic edge of the base. Reference is then made to the arrangement of atoms sketched in Fig.1. All atoms whose projections on the plane of the edge have at least half their area unobscured by the projections of other atoms are considered to be in the first layer. When "steps" occur, such cases as atoms 3 in Fig.1 are ambiguous with respect to the definition. Calculations for such cases were carried out under both possible assumptions. Calculations were made of surface concentrations of monolayers of adsorbed atoms of various sorts on a volume-centered cube structured base.

Card 1/2





26.2312

9,3120 (1003, 1137, 1140)

S/109/60/005/008/003/024  
E140/E555

AUTHORS: Komar, A.P., Savchenko, V.P. and Shrednik, V.N.  
TITLE: Adsorption, Migration and Evaporation of Be Deposited  
on W monocrystal  
PERIODICAL: Radiotekhnika i elektronika, 1960, Vol. 5, No. 8,  
pp. 1211-1217.

TEXT: The system Be-W is of interest for several reasons. Be is an alkali-earth metal and Be films should reduce the W work function; published measurements of Be work function date back 20 years, and the study of Be on W monocrystal would permit verification of Drechsler's calculations (Ref. 7) concerning migration and evaporation of atoms on W monocrystals for the region of small adsorbate atomic radii. A study was accordingly carried out, using a Müller projector (Ref. 8). Emission patterns were obtained showing the migration of beryllium over a tungsten monocrystal (Fig. 1); the behaviour of thick films (Fig. 2) and evaporation (Fig. 3). It was found that Be work function is higher than that of W. (Preliminary results give  $\phi_{Be} = 5$  eV). It was further found that the work function of W is either increased or decreased by a beryllium monolayer, in dependence on crystallographic direction.

Card 1/2

S/109/60/005/008/003/024  
E140/E555

Adsorption, Migration and Evaporation of Be Deposited on W  
Monocrystal

This phenomenon is considered to support the hypothesis that changes in the magnitude and sign of work function in a monolayer are mainly influenced by the difference of adsorbate and adsorbent work functions rather than the ionisation potential of the adsorbate and the work function of the adsorbent. There are 3 figures and 19 references: 6 Soviet and 13 non-Soviet. Acknowledgments are made to V. Ye. Ivanov for the pure beryllium samples.

ASSOCIATION: Fiziko-tehnicheskii institut AN SSSR (Physico-technical Institute AS USSR)

SUBMITTED: December 21, 1959

Card 2/2

S/109/60/005/008/021/024  
E140/E355

9,3120 (1003,1137,1140)

AUTHORS: Komar, A. P., Savchenko, V. P. and Shrednik, V. N.

TITLE: A New Method of Preparing Field Emitters From  
Low-melting Point Metals and Alloys

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol. 5,  
No. 8, pp. 1342 - 1346

TEXT: Field emitters of Ni<sub>3</sub>Mn and similar materials have  
been prepared by the use of vacuum breakdown in a projector  
tube between a point of the investigated material (negative  
electrode) and the screen (positive electrode). A resistive  
or inductive element is used to restrict the breakdown to a  
local breakdown. This resulted in the formation of  
protuberances. A number of field emission patterns obtained  
in the projector tube are reproduced.  
There are 3 figures and 7 references: 2 Soviet and  
5 non-Soviet.

Card 1/2

S/109/60/005/008/021/024  
E140/E355

A New Method of Preparing Field Emitters From Low-melting  
Point Metals and Alloys

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR  
(Physicotechnical Institute, AS USSR)

SUBMITTED: December 21, 1959

Card 2/2

26.2312

24916

S/181/61/003/006/013/031  
B102/B2019,4300

AUTHOR:

Shrednik, V.N.

TITLE:

Study of atomic zirconium layers on tungsten crystal faces  
by means of electron and ion projectors

PERIODICAL: Fizika tverdogo tela, v. 3, no. 6, 1961, 1750 - 1761

TEXT: This is a very detailed report on studies conducted on the metal film system Zr-W by means of electron- and ion- (deuteron- and proton-) projectors; the adsorbed Zr layers on the W cube faces {100} and in their neighborhood (termed "cube-near" regions) were observed in the individual successive stages of adsorption. A characteristic feature of zirconium-coated tungsten is the appearance of symmetrically arranged bright spots in the emission picture of tungsten. A study of the behavior of Zr adsorbed on W in the {100} regions is of interest both because of the work function of W which is considerably reduced by Zr, and in view of the problem of adsorption binding on the metal surface. The use of an ion projector proved to be highly suited because of its high resolution and its sensitivity to local field strength fluctuations. Because of the strong field (which leads to Zr desorption) required by a helium projector

Card 1/4

24916

S/181/61/003/006/013/031  
B102/B201

Study of atomic zirconium ...

the latter was not usable. The author made use of a nitrogen-cooled hydrogen- and deuterium detector (operative field strength 200 mv/cm); the latter, of course, yielded the better contrasts, i.e., the better pictures. The work function was determined from inclination of the Fowler-Nordheim straight line and was found to be  $\phi_w = 4.5$  ev. A very detailed report based on numerous microphotographs is offered of the results of very careful studies of the emission properties and of microstructure (resolution up to 10 - 15 Å with deutron projector) of Zr layers at the {100} region of W crystals with layer thicknesses of fractions of monatomic to multiatomic ones. Measurements at low Zr concentrations were made both with the ion projector and, at nitrogen temperature ( $-195.8^\circ\text{C}$ ) and after a one-minute heating of the surface at  $\sim 1000^\circ\text{C}$ , with the electron projector. The picture taken at  $-196^\circ\text{C}$  and 20 kv with the deutron projector presents dark islets (radius up to 500 Å), which are surrounded by bright points in a ring-shaped arrangement. At high Zr concentrations, the pictures were taken with electron- and proton projectors only, namely, after a one-minute heating to  $1500 \pm 50^\circ\text{C}$ . Pictures taken with a proton projector exhibit dark spots (the {100} regions), and

Card 2/4

24916

S/181/61/003/006/013/031  
B102/B201

Study of atomic zirconium ...

all around more than seven not quite ring-shaped and not quite closed bright rings. Heating without electric field in hydrogen atmosphere ( $10^{-3}$  mm Hg) for 30 sec at 2000-2200°C resulted in an enlargement of the rings (enlargement of the steps). In case of nearly monatomic layers the lowest work function (2.62 eV) was measured; on a further adsorption the next step was already attained ( $\phi_w = 2.75$  eV). The pictures were taken after a one-minute heating to 900-1000°C, in one case also at 1500°C (which, in turn, resulted in an enlargement of the steps). The pictures showed that (1) Zr at any concentrations gathers readily in the {100} regions of W, and (2) that adsorbed Zr can be rendered well visible in the electron projector due to its reduction of the W work function, and in the ion projector due to its causing a strong roughening of the surface; (3) ring-shaped steps enlarging the local field are readily formed in the {100} region at high Zr concentrations. The particular aspects are mainly connected with the fact that the diameter of the zirconium atom coincides with the tungsten lattice constant (3.16 Å). The diminution of  $\phi_w$  caused by zirconium in the {100} regions is connected with the structure of the monatomic Zr layer. The high surface concentration of the Zr monolayer on

Card 3/4

Study of atomic zirconium ... 24916

S/181/61/003/006/013/031  
B102/B201

the {100} face entails a high dipole density, and thus a considerable potential jump. The strong diminution of  $\gamma$ , due to zirconium on the {100} faces may be utilized for the production of surfaces with  $\gamma \sim 2.5$  eV, which are resistant to longer heating (up to hours) to not beyond 1300°C. Beyond 1300°C, the Zr-W dipole surface layer is destroyed due to the diffusion of Zr into W. A.P. Komar is finally thanked for his supervision of the work, and L.N. Dobretsov, E.Ya. Zandberg, N.I. Ionov, V.P. Savchenko, and L.M. Nikolayeva for their assistance and discussions. There are 14 figures and 18 references: 6 Soviet-bloc and 12 non-Soviet-bloc. The references to English-language publications read as follows: R.H. Fowler, L.W. Nordheim. Proc. Roy. Soc. A119, 173, 1928; E.W. Mueller, K. Bahadur. Phys. Rev. 102, 624, 1956; C. Zwikker, Phys. Rev. 30, 578 1929

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A.F. Ioffe AN SSSR Leningrad  
(Institute of Physics and Technology imeni A.F. Ioffe AS  
USSR Leningrad)

SUBMITTED: December 30, 1960

Card 4/4



S/020/62/144/003/014/030  
B108/3102

AUTHORS: Komar, A. P., Academician AS UkrSSR, and Shrednik, V. N.

TITLE: Atomic structure of tungsten microcrystals of up to 60 Å size

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 144, no. 3, 1962, 541-543

TEXT: Tungsten microcrystals having radius of some 200 Å were studied by using an ion projector with helium ions at 9.5 kv. The point of the projector was cooled with solid nitrogen. The images obtained were very clear. The image can be improved considerably when the point contains "tubercles" caused by vacuum discharge. Using such a procedure the authors succeeded in observing the atomic structure of tungsten microcrystals having a diameter of some 60 Å. The most important English-language reference is: E. W. Müller, Adv. in Electronics and Electron Phys., 13, 83 (1960).

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR)

C: Card 1/2

KOMAR, A.P., akademik; SHREDNIK, V.N.

Atomic structure of tungsten microcrystals up to 60 Å in diameter. Dokl.AN SSSR 144 no.3:541-543 My '62. (MIRA 15:5)

1. Fiziko-tekhnicheskii institut im. A.F.Ioffe AN SSSR. 2. AN USSR (for Komar).

(Tungsten crystals) (Microradiography)

SHREDNIK, V.N.

Averaging of the autoelectronic emission of the work function.

Radiotekh. i elektron. 8 no.11:1933-1944 N '63.

(MIRA 17:1)

ACCESSION NR: AP4034935

S/0181/64/006/005/1501/1510

AUTHORS: Shrednik, V. N.; Snezhko, Ye. V.

TITLE: The surface concentration of sodium on tungsten and the anisotropy of the work function

SOURCE: Fizika tverdogo tela, v. 6, no. 5, 1964, 1501-1510

TOPIC TAGS: work function, sodium, tungsten, thin film, surface concentration, emission contrast

ABSTRACT: Metal films of the system Na-W were studied by means of a field-emission microscope. Methods for determining current flow of Na, for computing the concentration of Na on W (i.e., the degree of film coating), for determining the work function for two values of current and voltage, and for evaluating the latter by emission contrast have been outlined. In their experiments the authors sputtered Na on a single crystal of W, cooled by liquid N at different current flows of Na. The results of measurements show a dependence of the work function of different crystal faces (in W) on the surface concentration of Na. Even when the covering film is meager, Na everywhere lowers the work function of the W. The sharpest and greatest lowering of the work function by Na is observed

Card 1/2